

2010_11_15_Sequence_Listing

SEQUENCE LISTING

<110> STATENS SERUM INSTITUT
ANDERSEN, Peter

SKJOT, Rikke Louise Vinther

<120> TUBERCULOSIS VACCINE AND DIAGNOSTICS BASED ON THE MYCOBACTERIUM
TUBERCULOSIS SAT-6 GENE FAMILY

<130> 0459-0752P

<140> US 10/723,908

<141> 2003-11-26

<160> 59

<170> PatentIn 2.0

<210> 1

<211> 100

<212> PRT

<213> M. tuberculosis

<400> 1

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Asn Phe Glu Arg Ile Ser Gly Asp Leu Lys Thr Gln Ile Asp Gln Val
20 25 30
Glu Ser Thr Ala Gly Ser Leu Gln Gly Gln Trp Arg Gly Ala Ala Gly
35 40 45
Thr Ala Ala Gln Ala Ala Val Val Arg Phe Gln Glu Ala Ala Asn Lys
50 55 60
Gln Lys Gln Glu Leu Asp Glu Ile Ser Thr Asn Ile Arg Gln Ala Gly
65 70 75 80
Val Gln Tyr Ser Arg Ala Asp Glu Glu Gln Gln Ala Leu Ser Ser
85 90 95
Gln Met Gly Phe
100

<210> 2

<211> 95

<212> PRT

<213> M. tuberculosis

<400> 2

Met Thr Glu Gln Gln Trp Asn Phe Ala Gly Ile Glu Ala Ala Ser
1 5 10 15
Ala Ile Gln Gly Asn Val Thr Ser Ile His Ser Leu Leu Asp Glu Gly
20 25 30
Lys Gln Ser Leu Thr Lys Leu Ala Ala Ala Trp Gly Gly Ser Gly Ser
35 40 45
Glu Ala Tyr Gln Gly Val Gln Gln Lys Trp Asp Ala Thr Ala Thr Glu
50 55 60
Leu Asn Asn Ala Leu Gln Asn Leu Ala Arg Thr Ile Ser Glu Ala Gly
65 70 75 80
Gln Ala Met Ala Ser Thr Glu Gly Asn Val Thr Gly Met Phe Ala
85 90 95

<210> 3

<211> 96

<212> PRT

<213> M. tuberculosis

2010_11_15_Sequence_Listing

<400> 3
 Met Ser Gln Ile Met Tyr Asn Tyr Pro Ala Met Leu Gly His Ala Gly
 1 5 10 15
 Asp Met Ala Gly Tyr Ala Gly Thr Leu Gln Ser Leu Gly Ala Glu Ile
 20 25 30
 Ala Val Glu Gln Ala Ala Leu Gln Ser Ala Trp Gln Gly Asp Thr Gly
 35 40 45
 Ile Thr Tyr Gln Ala Trp Gln Ala Trp Asn Gln Ala Met Glu Asp
 50 55 60
 Leu Val Arg Ala Tyr His Ala Met Ser Ser Thr His Glu Ala Asn Thr
 65 70 75 80
 Met Ala Met Met Ala Arg Asp Thr Ala Glu Ala Ala Lys Trp Gly Gly
 85 90 95

<210> 4
<211> 294
<212> DNA
<213> M. tuberculosis

<220>
<221> CDS
<222> (1)...(294)

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 Met Ser Leu Leu Asp Ala His Ile Pro Gln Leu Val Ala Ser Gln Ser
 1 5 10 15
 gcg ttt gcc gcc aag gcg ggg ctg atg cg^g cac acg atc ggt cag gcc 96
 Ala Phe Ala Ala Lys Ala Gly Leu Met Arg His Thr Ile Gly Gln Ala
 20 25 30
 gag cag gcg gcg atg tcg gct cag gcg ttt cac cag ggg gag tcg tcg 144
 Glu Gln Ala Ala Met Ser Ala Gln Ala Phe His Gln Gly Glu Ser Ser
 35 40 45
 gcg gcg ttt cag gcc gcc cat gcc cg^g ttt gtg gcg gcg gcc gcc aaa 192
 Ala Ala Phe Gln Ala Ala His Ala Arg Phe Val Ala Ala Ala Ala Lys
 50 55 60
 gtc aac acc ttg ttg gat gtc gcg cag gcg aat ctg ggt gag gcc gcc 240
 Val Asn Thr Leu Leu Asp Val Ala Gln Ala Asn Leu Gly Glu Ala Ala
 65 70 75 80
 ggt acc tat gtg gcc gcc gat gct gcg gcc gcg tcg acc tat acc ggg 288
 Gly Thr Tyr Val Ala Ala Asp Ala Ala Ala Ser Thr Tyr Thr Gly
 85 90 95
 ttc tga 294
 Phe

<210> 5
<211> 97
<212> PRT
<213> M. tuberculosis

<400> 5
 Met Ser Leu Leu Asp Ala His Ile Pro Gln Leu Val Ala Ser Gln Ser
 1 5 10 15
 Ala Phe Ala Ala Lys Ala Gly Leu Met Arg His Thr Ile Gly Gln Ala

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20	25	30													
Glu	Gln	Ala	Ala	Met	Ser	Ala	Gln	Ala	Phe	His	Gln	Gly	Glu	Ser	Ser
35							40				45				
Ala	Ala	Phe	Gln	Ala	Ala	His	Ala	Arg	Phe	Val	Ala	Ala	Ala	Lys	
50							55				60				
Val	Asn	Thr	Leu	Leu	Asp	Val	Ala	Gln	Ala	Asn	Leu	Gly	Glu	Ala	Ala
65							70			75			80		
Gly	Thr	Tyr	Val	Ala	Ala	Asp	Ala	Ala	Ala	Ser	Thr	Tyr	Thr	Gly	
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Phe															

<210> 6

<211> 339

<212> DNA

<213> M. tuberculosis

<220>

<221> CDS

<222> (1)...(339)

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1 5 10 15	

ctt gtt gcg gaa ggg att gag gcc atc gtg ttt cgt act tta ggc gat Leu Val Ala Glu Gly Ile Glu Ala Ile Val Phe Arg Thr Leu Gly Asp	96
20 25 30	

cag tgc tgg ttg tgg gag tcg ctg ctg ccc gac gag gtg cgc cga ctg Gln Cys Trp Leu Trp Glu Ser Leu Leu Pro Asp Glu Val Arg Arg Leu	144
35 40 45	

ccc gag gaa ctg gcc cg ^g gtg gac gca ttg ttg gac gat ccg gcg ttc Pro Glu Glu Leu Ala Arg Val Asp Ala Leu Leu Asp Asp Pro Ala Phe	192
50 55 60	

ttc gcc ccg ttc gtg ccg ttc gac ccg cgc agg ggc ccg ccg tcg Phe Ala Pro Phe Val Pro Phe Asp Pro Arg Arg Gly Arg Pro Ser	240
65 70 75 80	

acg ccg atg gag gtc tat ctg cag ttg atg ttt gtg aag ttc cgc tac Thr Pro Met Glu Val Tyr Leu Gln Leu Met Phe Val Lys Phe Arg Tyr	288
85 90 95	

cg ^g ctg ggc tat gag tcg ctg tgc cgg gag gtg gct gat tcg atc acc Arg Leu Gly Tyr Glu Ser Leu Cys Arg Glu Val Ala Asp Ser Ile Thr	336
100 105 110	

tga	339
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<210> 7

<211> 112

<212> PRT

<213> M. tuberculosis

<400> 7

Met Ile Pro Gly Arg Met Val Leu Asn Trp Glu Asp Gly Leu Asn Ala	
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Leu Val Ala Glu Gly Ile Glu Ala Ile Val Phe Arg Thr Leu Gly Asp	
20 25 30	

Gln Cys Trp Leu Trp Glu Ser Leu Leu Pro Asp Glu Val Arg Arg Leu	
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2010_11_15_Sequence_Listing

35	40	45
Pro Glu Glu Leu Ala Arg Val Asp Ala Leu Leu Asp Asp Pro Ala Phe		
50	55	60
Phe Ala Pro Phe Val Pro Phe Phe Asp Pro Arg Arg Gly Arg Pro Ser		
65	70	75
Thr Pro Met Glu Val Tyr Leu Gln Leu Met Phe Val Lys Phe Arg Tyr		
85	90	95
Arg Leu Gly Tyr Glu Ser Leu Cys Arg Glu Val Ala Asp Ser Ile Thr		
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<210> 8

<211> 285

<212> DNA

<213> M. tuberculosis

<220>

<221> CDS

<222> (1)...(285)

<400> 8

atg acc atc aac tat caa ttc ggg gac gtc gac gct cac ggc gcc atg	48
Met Thr Ile Asn Tyr Gln Phe Gly Asp Val Asp Ala His Gln Ala Met	
1	5
10	15

atc cgc gct cag gcc ggg tcg ctg gag gcc gag cat cag gcc atc att	96
Ile Arg Ala Gln Ala Gly Ser Leu Glu Ala Glu His Gln Ala Ile Ile	
20	25
30	

tct gat gtg ttg acc gcg agt gac ttt tgg ggc ggc gcc ggt tcg gcg	144
Ser Asp Val Leu Thr Ala Ser Asp Phe Trp Gly Gly Ala Gly Ser Ala	
35	40
45	

gcc tgc cag ggg ttc att acc cag ctg ggc cgt aac ttc cag gtg atc	192
Ala Cys Gln Gly Phe Ile Thr Gln Leu Gly Arg Asn Phe Gln Val Ile	
50	55
60	

tac gag cag gcc aac gcc cac ggg cag aag gtg cag gct gcc ggc aac	240
Tyr Glu Gln Ala Asn Ala His Gly Gln Lys Val Gln Ala Ala Gly Asn	
65	70
75	80

aac atg gca caa acc gac agc gcc gtc ggc tcc agc tgg gcc taa	285
Asn Met Ala Gln Thr Asp Ser Ala Val Gly Ser Ser Trp Ala	
85	90

<210> 9

<211> 94

<212> PRT

<213> M. tuberculosis

<400> 9

Met Thr Ile Asn Tyr Gln Phe Gly Asp Val Asp Ala His Gln Ala Met	
1	5
10	15

Ile Arg Ala Gln Ala Gly Leu Leu Glu Ala Glu His Gln Ala Ile Val	
20	25
30	

Arg Asp Val Leu Ala Ala Gly Asp Phe Trp Gly Gly Ala Gly Ser Val	
35	40
45	

Ala Cys Gln Glu Phe Ile Thr Gln Leu Gly Arg Asn Phe Gln Val Ile	
50	55
60	

Tyr Glu Gln Ala Asn Ala His Gly Gln Lys Val Gln Ala Ala Gly Asn	
65	70
75	80

Asn Met Ala Gln Thr Asp Ser Ala Val Gly Ser Ser Trp Ala	
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85	90
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2010_11_15_Sequence_Listing

<210> 10
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<212> DNA
<213> M. tuberculosis

<220>
<221> CDS
<222> (1)...(282)

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Met Thr Ile Asn Tyr Gln Phe Gly Asp Val Asp Ala His Gly Ala Met
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atc cgc gct cag gcc ggg ttg ctg gag gcg gag cat cag gcc atc gtt
Ile Arg Ala Gln Ala Gly Leu Leu Glu Ala Glu His Gln Ala Ile Val
20 25 30 96

cgt gat gtg ttg gcc gcg ggt gac ttt tgg ggc ggc gcc ggt tcg gtg
Arg Asp Val Leu Ala Ala Gly Asp Phe Trp Gly Gly Ala Gly Ser Val
35 40 45 144

gct tgc cag gag ttc att acc cag ttg ggc cgt aac ttc cag gtg atc
Ala Cys Gln Glu Phe Ile Thr Gln Leu Gly Arg Asn Phe Gln Val Ile
50 55 60 192

tac gag cag gcc aac gcc cac ggg cag aag gtg cag gct gcc ggc aac
Tyr Glu Gln Ala Asn Ala His Gly Gln Lys Val Gln Ala Ala Gly Asn
65 70 75 80 240

aac atg gca caa acc gac agc gcc gtc ggc tcc agc tgg gcc
Asn Met Ala Gln Thr Asp Ser Ala Val Gly Ser Ser Trp Ala
85 90 282

tga

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<210> 11
<211> 94
<212> PRT
<213> M. tuberculosis

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<400> 11 Met Thr Ile Asn Tyr Gln Phe Gly Asp Val Asp Ala His Gly Ala Met
      1          5          10          15
Ile Arg Ala Gln Ala Gly Leu Leu Glu Ala Glu His Gln Ala Ile Val
      20          25          30
Arg Asp Val Leu Ala Ala Gly Asp Phe Trp Gly Gly Ala Gly Ser Val
      35          40          45
Ala Cys Gln Glu Phe Ile Thr Gln Leu Gly Arg Asn Phe Gln Val Ile
      50          55          60
Tyr Glu Gln Ala Asn Ala His Gly Gln Lys Val Gln Ala Ala Gly Asn
      65          70          75          80
Asn Met Ala Gln Thr Asp Ser Ala Val Gly Ser Ser Trp Ala
      85          90

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<210> 12
<211> 327
<212> DNA
<213> M. tuberculosis

<220>
<221> CDS

2010_11_15_Sequence_Listing

<222> (1)...(327)

<210> 13

<211> 108
212 555

<212> PRT

<213> M. tuberculosis

<400> 13

Met	Leu	Leu	Pro	Leu	Gly	Pro	Pro	Leu	Pro	Pro	Asp	Ala	Val	Val	Ala
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Lys	Arg	Ala	Glu	Ser	Gly	Met	Leu	Gly	Gly	Leu	Ser	Val	Pro	Leu	Ser
			20					25					30		
Trp	Gly	Val	Ala	Val	Pro	Pro	Asp	Asp	Tyr	Asp	His	Trp	Ala	Pro	Ala
			35				40				45				
Pro	Glu	Asp	Gly	Ala	Asp	Val	Asp	Val	Gln	Ala	Ala	Glu	Gly	Ala	Asp
	50				55				60						
Ala	Glu	Ala	Ala	Ala	Met	Asp	Glu	Trp	Asp	Glu	Trp	Gln	Ala	Trp	Asn
	65				70				75					80	
Glu	Trp	Val	Ala	Glu	Asn	Ala	Glu	Pro	Arg	Phe	Glu	Val	Pro	Arg	Ser
			85				90						95		
Ser	Ser	Ser	Val	Ile	Pro	His	Ser	Pro	Ala	Ala	Gly				
			100					105							

<210> 14

<211> 324

<212> DNA

<213> M. tuberculosis

<220>
<221>

<221> CDS
<222> (1)

222 (1)

<400> 14

2010_11_15_Sequence_Listing

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aac gcc ccg cgt cgg aat cgc gtt ggg cgg caa cat ggt tgg ccg gcc Asn Ala Pro Arg Arg Asn Arg Val Gly Arg Gln His Gly Trp Pro Ala 20 25 30	96
gac gtt ccg tcc gcc gag cag cgc cgc gcc caa cgg cag cgc gac ctc Asp Val Pro Ser Ala Glu Gln Arg Arg Ala Gln Arg Gln Arg Asp Leu 35 40 45	144
gag gct atc cgc cga gcg tac gcc gag atg gtg gcg aca tca cac gaa Glu Ala Ile Arg Arg Ala Tyr Ala Glu Met Val Ala Thr Ser His Glu 50 55 60	192
atc gac gac gac aca gcc gaa ctg gcg ctg ttg tcg atg cat ctc gac Ile Asp Asp Asp Thr Ala Glu Leu Ala Leu Leu Ser Met His Leu Asp 65 70 75 80	240
gat gag cag cgc cgg ctt gag gcg ggg atg aag ctc ggc tgg cat ccg Asp Glu Gln Arg Arg Leu Glu Ala Gly Met Lys Leu Gly Trp His Pro 85 90 95	288
tat cac ttc ccc gac gaa ccc gac agc aaa cag tga Tyr His Phe Pro Asp Glu Pro Asp Ser Lys Gln 100 105	324

<210> 15
<211> 107
<212> PRT
<213> M. tuberculosis

<400> 15
Met Thr His Lys Arg Thr Lys Arg Gln Pro Ala Ile Ala Ala Gly Leu
1 5 10 15
Asn Ala Pro Arg Arg Asn Arg Val Gly Arg Gln His Gly Trp Pro Ala
20 25 30
Asp Val Pro Ser Ala Glu Gln Arg Arg Ala Gln Arg Gln Arg Asp Leu
35 40 45
Glu Ala Ile Arg Arg Ala Tyr Ala Glu Met Val Ala Thr Ser His Glu
50 55 60
Ile Asp Asp Asp Thr Ala Glu Leu Ala Leu Leu Ser Met His Leu Asp
65 70 75 80
Asp Glu Gln Arg Arg Leu Glu Ala Gly Met Lys Leu Gly Trp His Pro
85 90 95
Tyr His Phe Pro Asp Glu Pro Asp Ser Lys Gln
100 105

<210> 16
<211> 246
<212> DNA
<213> M. tuberculosis

<220>
<221> CDS
<222> (1)...(246)

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Met Ser Gly His Ala Leu Ala Ala Arg Thr Leu Leu Ala Ala Ala Asp
1 5 10 15

48

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gag ctt gtc ggc ggc ccg cca gtc gag gct tcg gcc gcc gcg ctg gcc	96
Glu Leu Val Gly Gly Pro Pro Val Glu Ala Ser Ala Ala Ala Leu Ala	
20 25 30	
ggc gac gcc gcg ggc gca tgg cg acc gcg gcc gtc gag ctt gcg cga	144
Gly Asp Ala Ala Gly Ala Trp Arg Thr Ala Ala Val Glu Leu Ala Arg	
35 40 45	
gcf ttg gtc cgc gct gtg gcg gag tcg cac ggc gtc gcg gcc gtt ttg	192
Ala Leu Val Arg Ala Val Ala Glu Ser His Gly Val Ala Ala Val Leu	
50 55 60	
ttc gcc gcg acg gcc gcc gcg gcg gcc gtc gac cgg ggt gat ccg	240
Phe Ala Ala Thr Ala Ala Ala Ala Ala Val Asp Arg Gly Asp Pro	
65 70 75 80	
ccg tga	246
Pro	

<210> 17
<211> 81
<212> PRT
<213> M. tuberculosis

<400> 17
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Glu Leu Val Gly Gly Pro Pro Val Glu Ala Ser Ala Ala Leu Ala
20 25 30
Gly Asp Ala Ala Gly Ala Trp Arg Thr Ala Ala Val Glu Leu Ala Arg
35 40 45
Ala Leu Val Arg Ala Val Ala Glu Ser His Gly Val Ala Ala Val Leu
50 55 60
Phe Ala Ala Thr Ala Ala Ala Ala Ala Val Asp Arg Gly Asp Pro
65 70 75 80
Pro

<210> 18
<211> 294
<212> DNA
<213> M. tuberculosis

<220>
<221> CDS
<222> (1)...(294)

atg agt ttg ttg gat gcc cat att ccg cag ttg atc gct tcg cat acg	48
Met Ser Leu Leu Asp Ala His Ile Pro Gln Leu Ile Ala Ser His Thr	
1 5 10 15	
gcg ttt gcc gct aag gcg ggg ttg atg cgg cat acg atc ggt cag gcc	96
Ala Phe Ala Ala Lys Ala Gly Leu Met Arg His Thr Ile Gly Gln Ala	
20 25 30	
gag cag cag gcg atg tcg gcg cag gcg ttt cat cag gga gag tcc gcg	144
Glu Gln Gln Ala Met Ser Ala Gln Ala Phe His Gln Gly Glu Ser Ala	
35 40 45	

2010_11_15_Sequence_Listing

gcf gcf ttt cag ggt gcf cat gcc cgg ttt gtg gcc gcg gcc gcc aag Ala Ala Phe Gln Gly Ala His Ala Arg Phe Val Ala Ala Ala Ala Lys 50 55 60	192
gtc aat acc ttg ctg gat atc gcf caa gcc aat ttg ggt gag gcc gcg Val Asn Thr Leu Leu Asp Ile Ala Gln Ala Asn Leu Gly Glu Ala Ala 65 70 75 80	240
ggc acg tat gtg gcc gcc gat gcc gcc gcg tcc agc tac acc ggg Gly Thr Tyr Val Ala Ala Asp Ala Ala Ala Ser Ser Tyr Thr Gly 85 90 95	288
ttt tta Phe Leu	294

<210> 19
<211> 97
<212> PRT
<213> M. tuberculosis

<400> 19
Met Ser Leu Leu Asp Ala His Ile Pro Gln Leu Ile Ala Ser His Thr
1 5 10 15
Ala Phe Ala Ala Lys Ala Gly Leu Met Arg His Thr Ile Gly Gln Ala
20 25 30
Glu Gln Gln Ala Met Ser Ala Gln Ala Phe His Gln Gly Glu Ser Ala
35 40 45
Ala Ala Phe Gln Gly Ala His Ala Arg Phe Val Ala Ala Ala Lys
50 55 60
Val Asn Thr Leu Leu Asp Ile Ala Gln Ala Asn Leu Gly Glu Ala Ala
65 70 75 80
Gly Thr Tyr Val Ala Ala Asp Ala Ala Ala Ser Ser Tyr Thr Gly
85 90 95
Phe

<210> 20
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<212> DNA
<213> M. tuberculosis

<220>
<221> CDS
<222> (1)...(303)

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tcc gtt cgt cag gag atc cac acc acc gcg gcc cgt ttc aac gct gcg Ser Val Arg Gln Glu Ile His Thr Thr Ala Ala Arg Phe Asn Ala Ala 20 25 30	96
ctg caa gag ctg agg tcg cag atc gcg ccg ttg cag cag ctc tgg aca Leu Gln Glu Leu Arg Ser Gln Ile Ala Pro Leu Gln Gln Leu Trp Thr 35 40 45	144
cgg gaa gcg gcc gcc tac cac gcg gag caa ctc aag tgg cac cag Arg Glu Ala Ala Ala Ala Tyr His Ala Glu Gln Leu Lys Trp His Gln 50 55 60	192

2010_11_15_Sequence_Listing

gcg gcc agc gcg ctc aac gag atc ctg atc gac ttg gga aac gcg gtt	240
Ala Ala Ser Ala Leu Asn Glu Ile Leu Ile Asp Leu Gly Asn Ala Val	
65 70 75 80	

cgc cac ggt gcc gac gac gtg gcg cat gcc gac cg ^g cg ^g g ^g gct gga	288
Arg His Gly Ala Asp Asp Val Ala His Ala Asp Arg Arg Ala Ala Gly	
85 90 95	

gct tgg gca cgc tag	303
Ala Trp Ala Arg	
100	

<210> 21

<211> 100

<212> PRT

<213> M. tuberculosis

<400> 21

Met Asn Ala Asp Pro Val Leu Ser Tyr Asn Phe Asp Ala Ile Glu Tyr	
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Ser Val Arg Gln Glu Ile His Thr Thr Ala Ala Arg Phe Asn Ala Ala	
20 25 30	
Leu Gln Glu Leu Arg Ser Gln Ile Ala Pro Leu Gln Gln Leu Trp Thr	
35 40 45	
Arg Glu Ala Ala Ala Ala Tyr His Ala Glu Gln Leu Lys Trp His Gln	
50 55 60	
Ala Ala Ser Ala Leu Asn Glu Ile Leu Ile Asp Leu Gly Asn Ala Val	
65 70 75 80	
Arg His Gly Ala Asp Asp Val Ala His Ala Asp Arg Arg Ala Ala Gly	
85 90 95	
Ala Trp Ala Arg	
100	

<210> 22

<211> 378

<212> DNA

<213> M. tuberculosis

<220>

<221> CDS

<222> (1)...(378)

<400> 22

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gtc cta ctt gat gtg agc aca ccg aac acg ctg aac gcc gac ttt gac	96
Val Leu Leu Asp Val Ser Thr Pro Asn Thr Leu Asn Ala Asp Phe Asp	
20 25 30	

ctg atg cgt tcg gtt gcg ggt atc acg gac gcc cg ^g aat gag gaa atc	144
Leu Met Arg Ser Val Ala Gly Ile Thr Asp Ala Arg Asn Glu Glu Ile	
35 40 45	

cgt gcg atg ctg cag gca ttc atc ggc cg ^g atg agc ggt gtg ccg ccg	192
Arg Ala Met Leu Gln Ala Phe Ile Gly Arg Met Ser Gly Val Pro Pro	
50 55 60	

tcg gtg tgg ggt ggg ctc gcg gcc gct cg ^g ttc cag gat gtg gtg gat	240
Ser Val Trp Gly Gly Leu Ala Ala Arg Phe Gln Asp Val Val Asp	

2010_11_15_Sequence_Listing

65	70	75	80	
cgc tgg aac gcc gag tcg acg cg ^g ctc tac cac gtc ctg cac gc ^g atc				288
Arg Trp Asn Ala Glu Ser Thr Arg Leu Tyr His Val Leu His Ala Ile				
85	90	95		
gcc gac acc atc cg ^c cac aac gag gc ^c gcg ctg cg ^g gaa gc ^c ggc caa				336
Ala Asp Thr Ile Arg His Asn Glu Ala Ala Leu Arg Glu Ala Gly Gln				
100	105	110		
atc cat gcc cg ^c cac atc gc ^c gc ^c ggc ggc gac cta tag				378
Ile His Ala Arg His Ile Ala Ala Ala Gly Gly Asp Leu				
115	120	125		

<210> 23
<211> 125
<212> PRT
<213> M. tuberculosis

<400> 23
Met Val Glu Pro Gly Arg Ile Gly Gly Asn Gln Thr Arg Leu Ala Ala
1 5 10 15
Val Leu Leu Asp Val Ser Thr Pro Asn Thr Leu Asn Ala Asp Phe Asp
20 25 30
Leu Met Arg Ser Val Ala Gly Ile Thr Asp Ala Arg Asn Glu Glu Ile
35 40 45
Arg Ala Met Leu Gln Ala Phe Ile Gly Arg Met Ser Gly Val Pro Pro
50 55 60
Ser Val Trp Gly Gly Leu Ala Ala Arg Phe Gln Asp Val Val Asp
65 70 75 80
Arg Trp Asn Ala Glu Ser Thr Arg Leu Tyr His Val Leu His Ala Ile
85 90 95
Ala Asp Thr Ile Arg His Asn Glu Ala Ala Leu Arg Glu Ala Gly Gln
100 105 110
Ile His Ala Arg His Ile Ala Ala Gly Gly Asp Leu
115 120 125

<210> 24
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<220>
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<222> (1)...(288)

<400> 24
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Met Ser Asp Gln Ile Thr Tyr Asn Pro Gly Ala Val Ser Asp Phe Ala
1 5 10 15
tcc gac gtg ggc tcg cg^c gc^c ggc cag ctc cac atg att tac gaa gac
Ser Asp Val Gly Ser Arg Ala Gly Gln Leu His Met Ile Tyr Glu Asp
20 25 30
acc gcc agc aaa aca aat gc^c ctg caa gag ttt ttc gc^c ggc cac ggc
Thr Ala Ser Lys Thr Asn Ala Leu Gln Glu Phe Phe Ala Gly His Gly
35 40 45
gc^c caa ggg ttt ttc gac gc^c cag gc^c cag atg ctg tcg ggg ctg cag
Ala Gln Gly Phe Phe Asp Ala Gln Ala Gln Met Leu Ser Gly Leu Gln
50 55 60
48 96 144 192

2010_11_15_Sequence_Listing

ggg ctc att gag acg gtg ggt cag cat ggg act acc acc ggc cac gtg	240
Gly Leu Ile Glu Thr Val Gly Gln His Gly Thr Thr Thr Gly His Val	
65 70 75 80	

ctg gac aac gcg atc gga acc gac cag gcc atc gcg ggc ttg ttc taa	288
Leu Asp Asn Ala Ile Gly Thr Asp Gln Ala Ile Ala Gly Leu Phe	
85 90 95	

<210> 25

<211> 95

<212> PRT

<213> M. tuberculosis

<400> 25	
Met Ser Asp Gln Ile Thr Tyr Asn Pro Gly Ala Val Ser Asp Phe Ala	
1 5 10 15	
Ser Asp Val Gly Ser Arg Ala Gly Gln Leu His Met Ile Tyr Glu Asp	
20 25 30	
Thr Ala Ser Lys Thr Asn Ala Leu Gln Glu Phe Phe Ala Gly His Gly	
35 40 45	
Ala Gln Gly Phe Phe Asp Ala Gln Ala Gln Met Leu Ser Gly Leu Gln	
50 55 60	
Gly Leu Ile Glu Thr Val Gly Gln His Gly Thr Thr Thr Gly His Val	
65 70 75 80	
Leu Asp Asn Ala Ile Gly Thr Asp Gln Ala Ile Ala Gly Leu Phe	
85 90 95	

<210> 26

<211> 324

<212> DNA

<213> M. tuberculosis

<220>

<221> CDS

<222> (1)...(324)

<400> 26

gtg gca gac aca att cag gta aca ccg cag atg ctg cgc agc acc gcc	48
Val Ala Asp Thr Ile Gln Val Thr Pro Gln Met Leu Arg Ser Thr Ala	
1 5 10 15	

aac gat atc cag gcg aat atg gag caa gcc atg gga atc gcc aag ggc	96
Asn Asp Ile Gln Ala Asn Met Glu Gln Ala Met Gly Ile Ala Lys Gly	
20 25 30	

tac cta gcc aac cag gaa aac gtc atg aac ccc gcc acc tgg tct ggt	144
Tyr Leu Ala Asn Gln Glu Asn Val Met Asn Pro Ala Thr Trp Ser Gly	
35 40 45	

acc ggc gtc gtt gct tcg cat atg aca gcc acc gag atc acc aat gaa	192
Thr Gly Val Val Ala Ser His Met Thr Ala Thr Glu Ile Thr Asn Glu	
50 55 60	

ttg aac aag gtc ctt acc ggg ggc acg cgc ctg gcc gag ggc ctc gtg	240
Leu Asn Lys Val Leu Thr Gly Gly Thr Arg Leu Ala Glu Gly Leu Val	
65 70 75 80	

cag gcc gca gcc ctg atg gag gga cac gag ggc gac tcg cag aca gcg	288
Gln Ala Ala Ala Leu Met Glu Gly His Glu Ala Asp Ser Gln Thr Ala	
85 90 95	

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ttt cag gcg ctg ttc ggc gct agc cac gga tcc tga
 Phe Gln Ala Leu Phe Gly Ala Ser His Gly Ser
 100 105

324

<210> 27
 <211> 107
 <212> PRT
 <213> M. tuberculosis

<400> 27
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 1 5 10 15
 Asn Asp Ile Gln Ala Asn Met Glu Gln Ala Met Gly Ile Ala Lys Gly
 20 25 30
 Tyr Leu Ala Asn Gln Glu Asn Val Met Asn Pro Ala Thr Trp Ser Gly
 35 40 45
 Thr Gly Val Val Ala Ser His Met Thr Ala Thr Glu Ile Thr Asn Glu
 50 55 60
 Leu Asn Lys Val Leu Thr Gly Gly Thr Arg Leu Ala Glu Gly Leu Val
 65 70 75 80
 Gln Ala Ala Ala Leu Met Glu Gly His Glu Ala Asp Ser Gln Thr Ala
 85 90 95
 Phe Gln Ala Leu Phe Gly Ala Ser His Gly Ser
 100 105

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 <212> DNA
 <213> M. tuberculosis

<220>
 <221> CDS
 <222> (1)...(273)

<400> 28
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 Val Asp Pro Thr Val Leu Ala Asp Ala Val Ala Arg Met Ala Glu Phe
 1 5 10 15
 ggt cgc cac gtc gag gag ctg gtc gcc gag att gag tcc ttg gtt acc
 Gly Arg His Val Glu Glu Leu Val Ala Glu Ile Glu Ser Leu Val Thr
 20 25 30
 cggt ctg cat gtg acg tgg acg ggg gag ggc gcg gct cat gct gag
 Arg Leu His Val Thr Trp Thr Gly Glu Gly Ala Ala Ala His Ala Glu
 35 40 45
 gcg caa cga cat tgg gct gcc ggt gag gcg atg atg cgc cag gcg ttg
 Ala Gln Arg His Trp Ala Ala Gly Glu Ala Met Met Arg Gln Ala Leu
 50 55 60
 gcc cag ctc acg gcc gcg ggg cag agc gcg cac gcc aac tac acc ggc
 Ala Gln Leu Thr Ala Ala Gly Gln Ser Ala His Ala Asn Tyr Thr Gly
 65 70 75 80
 gcg atg gcc acg aat ttg ggt atg tgg tcg tga
 Ala Met Ala Thr Asn Leu Gly Met Trp Ser
 85 90

48 96 144 192 240 273

<210> 29
 <211> 90

2010_11_15_Sequence_Listing

<212> PRT

<213> M. tuberculosis

<400> 29

Met	Asp	Pro	Thr	Val	Leu	Ala	Asp	Ala	Val	Ala	Arg	Met	Ala	Glu	Phe
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Gly	Arg	His	Val	Glu	Glu	Leu	Val	Ala	Glu	Ile	Glu	Ser	Leu	Val	Thr
				20				25			30				
Arg	Leu	His	Val	Thr	Trp	Thr	Gly	Glu	Gly	Ala	Ala	Ala	His	Ala	Glu
					35		40			45					
Ala	Gln	Arg	His	Trp	Ala	Ala	Gly	Glu	Ala	Met	Met	Arg	Gln	Ala	Leu
					50		55			60					
Ala	Gln	Leu	Thr	Ala	Ala	Gly	Gln	Ser	Ala	His	Ala	Asn	Tyr	Thr	Gly
					65		70			75			80		
Ala	Met	Ala	Thr	Asn	Leu	Gly	Met	Trp	Ser						
					85				90						

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<211> 312

<212> DNA

<213> M. tuberculosis

<220>

<221> CDS

<222> (1)...(312)

<400> 30

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Met	Gly	Ala	Asp	Asp	Thr	Leu	Arg	Val	Glu	Pro	Ala	Val	Met	Gln	Gly	
1			5					10					15			

ttc	gcc	gcf	tcg	ttg	gat	gga	gcf	gcc	gag	cat	ctc	gcf	gtt	caa	ctg	96
Phe	Ala	Ala	Ser	Leu	Asp	Gly	Ala	Ala	Glu	His	Leu	Ala	Val	Gln	Leu	
				20				25					30			

gcc	gag	ctg	gac	gct	cag	gtc	ggg	cag	atg	ttg	ggc	ggg	tgg	cgc	ggg	144
Ala	Glu	Leu	Asp	Ala	Gln	Val	Gly	Gln	Met	Leu	Gly	Gly	Trp	Arg	Gly	
				35				40				45				

gcf	tcg	ggc	agt	gcf	tat	ggc	tcg	gcf	tgg	gag	cta	tgg	cat	cgc	ggg	192
Ala	Ser	Gly	Ser	Ala	Tyr	Gly	Ser	Ala	Trp	Glu	Leu	Trp	His	Arg	Gly	
				50				55			60					

gcc	ggt	gag	gtg	cag	ctg	gga	ttg	tcg	atg	ctg	gcf	gcf	gcf	ata	gct	240
Ala	Gly	Glu	Val	Gln	Leu	Gly	Leu	Ser	Met	Leu	Ala	Ala	Ala	Ile	Ala	
				65			70		75						80	

cac	gcc	ggt	gcf	ggt	tat	caa	cac	aac	gag	acc	gcf	tcg	gcf	cag	gtg	288
His	Ala	Gly	Ala	Gly	Tyr	Gln	His	Asn	Glu	Thr	Ala	Ser	Ala	Gln	Val	
				85				90					95			

ctt	cgt	gag	gtg	ggc	ggt	gcy	ggc	tga								312
Leu	Arg	Glu	Val	Gly	Gly	Gly										
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<210> 31

<211> 103

<212> PRT

<213> M. tuberculosis

<400> 31

Met	Gly	Ala	Asp	Asp	Thr	Leu	Arg	Val	Glu	Pro	Ala	Val	Met	Gln	Gly
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2010_11_15_Sequence_Listing

1 5 10 15
Phe Ala Ala Ser Leu Asp Gly Ala Ala Glu His Leu Ala Val Gln Leu
20 25 30
Ala Glu Leu Asp Ala Gln Val Gly Gln Met Leu Gly Gly Trp Arg Gly
35 40 45
Ala Ser Gly Ser Ala Tyr Gly Ser Ala Trp Glu Leu Trp His Arg Gly
50 55 60
Ala Gly Glu Val Gln Leu Gly Leu Ser Met Leu Ala Ala Ala Ile Ala
65 70 75 80
His Ala Gly Ala Gly Tyr Gln His Asn Glu Thr Ala Ser Ala Gln Val
85 90 95
Leu Arg Glu Val Gly Gly Gly
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<210> 32

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic cloning primer

<400> 32

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26

<210> 33

<211> 31

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<220>

<223> Synthetic cloning primer

<400> 33

ctaagcttgg atcctcagaa cccgtatag g

31

<210> 34

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic cloning primer

<400> 34

ctgagatctt tgatccccgg tcggatggtg

30

<210> 35

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic cloning primer

<400> 35

ctccccatggg tcaggtgatc gaatcagcca

30

<210> 36

<211> 25

<212> DNA

<213> Artificial Sequence

2010_11_15_Sequence_Listing

<220>
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<400> 36
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<210> 37
<211> 32
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<400> 37
ctaagttgg atccttaggc ccagctggag cc 32

<210> 38
<211> 25
<212> DNA
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<400> 38
ctgagatcta tgaccatcaa ctatc 25

<210> 39
<211> 32
<212> DNA
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<400> 39
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<210> 40
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<210> 42
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<220>
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<400> 44 ctgagatcta tgagcggcca cgcgttggct 30

<210> 45
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<220>
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<400> 46 ctgagatcta tgagtttgtt ggatgccat 30

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<210> 49
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<400> 49 ctaagcttgg atccctagcg tgcccaagct cc 32

<210> 50
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<400> 50 ctgagatcta tggttgaacc ggaaagg 27

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<210> 52
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<400> 52 ctgagatcta tgtcagatca aatcacg 27

<210> 53
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2010_11_15_Sequence_Listing

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2010_11_15_Sequence_Listing

<220>
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30